

## **What is claimed is:**

**[Claim 1]** 1. An x-ray detector storage device comprising:

a storage bin sized to store at least one x-ray detector; and  
a temperature regulator configured to adjust a temperature of a stored x-ray detector to a desired temperature.

**[Claim 2]** 2. The x-ray detector storage device of claim 1 wherein the storage bin is configured to store an x-ray detector that is detached from an x-ray scanner.

**[Claim 3]** 3. The x-ray detector storage device of claim 1 wherein the storage bin is remote from an x-ray scanner.

**[Claim 4]** 4. The x-ray detector storage device of claim 1 wherein the storage bin includes a data port to interface with a stored x-ray detector and route temperature data of the stored x-ray detector to the temperature regulator.

**[Claim 5]** 5. The x-ray detector storage device of claim 1 wherein the temperature regulator is configured to effectuate an increase or a decrease in the temperature of the stored x-ray detector to adjust the temperature of the x-ray detector to the desired temperature.

**[Claim 6]** 6. The x-ray detector storage device of claim 1 wherein the temperature regulator includes a controller configured to compare the temperature of the stored x-ray detector to the desired temperature and, from the comparison, determine a rate of temperature adjustment needed to bring the temperature of the stored x-ray detector to the desired temperature without placing thermal stress on internal components of the stored x-ray detector.

**[Claim 7]** 7. The x-ray detector storage device of claim 1 wherein the temperature regulator includes a thermo-electric cooling device to adjust the temperature of the stored x-ray detector.

**[Claim 8]** 8. The x-ray detector storage device of claim 7 wherein the thermo-electric cooling device is a Peltier device.

[Claim 9] 9. The x-ray detector storage device of claim 1 wherein the temperature regulator includes a compressor for passing compressed air about one or more outer surfaces of the stored x-ray detector.

[Claim 10] 10. The x-ray detector storage device of claim 1 wherein the temperature regulator includes a closed coolant circuit and a coolant source designed to circulate coolant about the stored x-ray detector.

[Claim 11] 11. The x-ray detector storage device of claim 1 wherein the temperature regulator includes one or more fans.

[Claim 12] 12. The x-ray detector storage device of claim 11 wherein the one or more fans is variable speed controllable.

[Claim 13] 13. The x-ray detector storage device of claim 1 wherein the temperature regulator includes a heat sink constructed to engage a heated surface of the stored x-ray detector.

[Claim 14] 14. The x-ray detector storage device of claim 1 wherein the storage bin is configured to store multiple x-ray detectors and wherein the temperature regulator is configured to independently adjust a temperature of the multiple x-ray detectors.

[Claim 15] 15. The x-ray detector storage device of claim 1 further comprising an LED constructed to provide a visual indication that a stored x-ray detector has a temperature substantially equivalent to the desired temperature.

[Claim 16] 16. An x-ray detector storage apparatus comprising:

- a receptacle sized to receive an x-ray detector during non-use of the x-ray detector;

- a temperature control interface connected to the receptacle and configured to provide feedback as to a temperature of an x-ray detector when the x-ray detector is disposed within the receptacle;

- a thermal exchange system configured to regulate the temperature of an x-ray detector when the x-ray detector is disposed within the receptacle;
- and

a controller operationally connected to receive the feedback and control the thermal exchange system to reduce a difference between the temperature of an x-ray detector disposed in the receptacle and a desired temperature.

[Claim 17] 17. The apparatus of claim 16 wherein the thermal exchange system is configured to regulate thermal exchange with an x-ray detector using at least one of convection, conduction, and radiation.

[Claim 18] 18. The apparatus of claim 17 wherein the thermal exchange system includes one of a forced air exchange, a cold plate, a heat sink, and a thermo-electric cooling device.

[Claim 19] 19. The apparatus of claim 16 wherein the controller is further configured to control the thermal exchange system to transfer heat to the x-ray detector if the temperature of the x-ray detector is less than a desired temperature for data acquisition and remove heat from the x-ray detector if the temperature of the x-ray detector exceeds a desired temperature for data acquisition.

[Claim 20] 20. The apparatus of claim 16 configured to be remote from an x-ray scanner.

[Claim 21] 21. The apparatus of claim 16 further comprising a proximity sensor electronically connected to the controller and configured to provide feedback to the controller as to whether an x-ray detector is disposed in the receptacle.

[Claim 22] 22. The apparatus of claim 21 wherein the controller is further configured to repeatedly acquire temperature data from an x-ray detector deemed present in the receptacle.

[Claim 23] 23. The apparatus of claim 16 wherein the receptacle is further configured to receive a plurality of x-ray detectors.

[Claim 24] 24. The apparatus of claim 16 wherein the receptacle is sized to receive a flat panel, solid state x-ray detector.

[Claim 25] 25. An x-ray detector docking station comprising:

a storage bin sized to receive one or more flat panel x-ray detectors;  
an interface configured to receive temperature data from a flat panel x-ray detector disposed in the storage bin; and  
means for regulating a temperature of the flat panel x-ray detector based on temperature data received from the interface.

[Claim 26] 26. The x-ray detector docking station of claim 25 further comprising means for charging a battery of a stored flat panel x-ray detector.